



USER’S MANUAL – ENGLISH

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updated versions are published at: www.tinkerbots.com

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1) Identification

Tinkerbots® - Patent 8,851,953 B2
Wheeler Set (4251161800015) | Advanced Builder Set (4251161800022)
Sensoric Mega Set (4251161800039)

Kinematics GmbH, Börnicker Chaussee 1–2, 16321 Bernau bei Berlin
email: hello@tinkerbots.com

Model: TB1501
FCC ID: 2AFV5-TB1501
IC: 20598-TB1501

(1) This device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Cet appareil est conforme avec Industrie Canada exempts de licence standard RSS (s). Son fonctionnement est soumis aux deux conditions suivantes: (1) Cet appareil ne doit pas provoquer d'interférences et (2) cet appareil doit accepter toute interference, y compris celles pouvant causer un mauvais fonctionnement de l'appareil.

2) Safety; appropriate and responsible use

a. To ensure safe and correct use, this manual, as well as all accompanying information (including the packaging) should be read carefully and kept in a safe place for future use.

b. The following signal words are employed in this manual to highlight potential risks or dangers:



DANGER This signal word is used to indicate a potentially hazardous situation which, if not avoided, will result in death or serious injury.



WARNING This signal word is used to indicate a potentially hazardous situation which could result in death or serious injury.



CAUTION This signal word is used to indicate a potentially hazardous situation which could result in minor or moderate injury.

NOTICE This signal word is used to indicate the possibility of harm to the environment and/or damage to property.



DANGER As a fire-prevention measure, protect the power-supply unit and charge adapter from overheating; never cover. In the event of deformation, extreme heat development, malfunction or damage of any kind, immediately remove the power-supply unit and charge adapter from operation, to avoid any risk of fire or electric shock. Use only power-supply units of the same type as replacements. The power-supply unit and charge adapter may only be used by adults or under the supervision of adults. The power-supply unit is not a toy!



WARNING Tinkerbots contains a lithium-ion battery system which is permanently built into the Powerbrain and cannot be replaced. Mechanical damage can lead to internal short circuiting and battery overheating – danger of fire. In the event of visible damage to, and/or deformation of the Powerbrain, malfunction or heat development, the Powerbrain must immediately be removed from operation and disposed of in an appropriate manner. Avoid all contact with any leaking fluids.



WARNING This toy is not suitable for children under three years of age. Small parts. Choking hazard. Children under six years of age should be continuously supervised while using Tinkerbots.

NOTICE Tinkerbots is a toy for children, and is not intended for professional use (e.g., as a tool). Tinkerbots is intended solely for use at room temperature in dry, clean environments. To prevent damage through short circuiting, avoid all contact with fluids. To ensure problem-free function and a long life-span, never use Tinkerbots on soiled or sandy surfaces, and protect it from both dirt and dust.

3) Product description; technical data

a. Content

Type series		TB1501			
Set composition		Wheeler Set	Advanced Builder Set	Sensoric Mega Set	
Powerbrain			1	1	1
11M.1PB.3020	red				
Pivot			1	1	2
10M.1PI.7047	grey				
Twister			0	1	1
10M.1TW.7047	grey				
Motor			1	1	2
10M.1M1.7047	grey				
IR Sensor			0	0	2
1SM.1IR.7047	grey				
Light Sensor			0	0	2
1SM.1LI.7047	grey				
Cube			0	0	1
1PM.1C1.7047	grey				
Grabber			0	0	1
10M.1GR.7047	grey				
Single Cubie I			0	6	6
1CM.1C1.1023	yellow				
Single Cubie II			0	6	6
1CM.1C2.1023	yellow				
Double Cubie I			0	2	2
1CM.1C3.1023	yellow				
Double Cubie II			2	2	2
1CM.1X1.1023	yellow				
Prism Cubie I			0	8	8
1CM.1P9.1023	yellow				
Prism Cubie I			0	2	2
1CM.1P9.5015	blue				
Prism Cubie II			0	6	6
1CM.1P6.1023	yellow				
Prism Cubie II			0	8	8
1CM.1P6.5015	blue				
Brick Adapter (m)			2	2	6
1CM.1LM.7047	grey				
Axle Short			4	4	4
1CM.1A1.9005	black				
Axle Long			2	2	2
1CM.1A2.9005	black				
Wheel			4	4	4
1CM.1WH.7047	grey				
Grabber Arm			0	0	3
10M.1GA.3020	red				
USB Cable			1	1	1
ZKT.1UK.9005	black				
Power Supply			1	1	1
ZKT.1NT.9005	black				
Charging Adapter			1	1	1
LA01	black				

b. Powerbrain

Illus. 1: On/Off (1), Record (2), Faster (3), Slower (4), LED Lamp (5) USB Port (6)

As in mobile telephones, the Powerbrain contains a non-replaceable, rechargeable lithium-ion battery system, including a battery management system, which regulates cell balancing, under- and over-voltage switch-off, over-temperature switch-off, short-circuit protection and overload protection.

Designation: micro battery system 2S2P HCC1325
Certification: UN 38.3, IEC 62133, UL2054
Capacity per battery system: 500mAh
Nominal voltage: 7.4V

External dimensions of battery system: ca. 29x28x28mm

To charge the Powerbrain's battery, the Powerbrain is connected via the supplied USB cable to the charging adapter and power supply. The Powerbrain's battery can only be charged using the charging adapter and power supply, and not by means of a computer or other devices. The Powerbrain is connected to a computer via the supplied USB cable only for the purpose of programming and executing updates.



WARNING Damage to the Powerbrain through external influences can damage the battery – danger of internal short-circuiting. The eventuality of humidity penetration cannot be excluded – danger through chemical reaction.

In the event of damage to, and deformation of the Powerbrain, malfunction or heat development, the Powerbrain must immediately be removed from operation and disposed of in an appropriate manner. Avoid all contact with any leaking fluids.

Do not throw or drop the Powerbrain. Avoid damaging or manipulating the Powerbrain (e.g., through drilling or welding, soldering cables onto it, placing objects in it, etc.).

Never throw the Powerbrain into an open fire or expose it to temperatures above 50°C (122°F). Shield from direct sunlight. Do not bring into contact with fluids. Shield from contact with moisture, e.g. high humidity.

In the event of fire, do not extinguish the Powerbrain with water. Use only extinguishers of fire classification D (dry powder), or smother flames with dry sand or woollen or cotton blankets. Never make contact with the burning Powerbrain with unprotected hands. Employ protective gloves or a shovel or tongs, and, if possible, place the Powerbrain in the open air as soon as possible.

The Powerbrain contains a light-emitting diode (LED). Do not view LED radiation directly with optical instruments – class 1M LED. Viewing the LED output with certain optical instruments (e.g. magnifying glasses and microscopes) from within a distance of 100 millimetres may be harmful to eyes.

The Powerbrain may only be opened by appropriately trained personnel.

NOTICE The Powerbrain may only be connected to devices in Protection Class II, which display the following symbol:

c. Power supply

EU-Version	US-Version
Model: HNP18-090L6	HNP18US-090L6
Input: 100-240VAC 50/60Hz, 0,55A MAX	100-240VAC 50/60Hz, 0,55A MAX
Output: 9V, 2000mA,	9V, 2000mA

The power supply may only be operated at room temperature.

d. Charging adapter

Illus. 2: Reset switch (7)

In the event of a Powerbrain malfunction (e.g., the Powerbrain cannot be switched off), connect the Powerbrain via the USB cable to the charging adapter and activate the reset switch. (A paper clip can, for example, be used for this purpose.) This will result in a restart of the Powerbrain.



DANGER Protect the power-supply unit and charge adapter from overheating; never cover them – danger of fire. In the event of visible damage and/or deformation to the power supply or charging adapter, or malfunction or heat development, the power-supply unit and charge adapter must immediately be removed from operation, to avoid the risk of fire or shocks. Replace only with power-supply units of the same type. The power-supply unit and charge adapter may only be used by adults or under the supervision of adults. The charging adapter and power supply must never be connected to devices other than the Tinkerbots Powerbrain.

NOTICE: Ensure that the plug socket being used is easily accessible.

4) Placing in operation

a. Before beginning

NOTICE Following transport under low temperatures (e.g., following delivery), or resp., following cool storage, first allow a number of minutes for the Tinkerbots to attain room temperature, in order to prevent damage through water condensation.

Charge the battery of the Powerbrain by connecting the power supply to the charging adapter. Connect the charging adapter via the USB cable to the Powerbrain (Illus. 3). The Powerbrain's LED lamp will go yellow and blink while the battery is being charged. Once charging is complete, it will remain yellow without blinking. The Powerbrain battery can only be charged using the charging adapter and power supply, not by means of a computer or other device. The battery's state of charge can be ascertained by consulting the Tinkerbots app while the Powerbrain is on. Recharge the battery following each use, including use for short periods. The battery has no memory function. Following recharging, remove the Powerbrain from the power supply.



WARNING Use only the supplied USB cable, charging adapter and power supply to charge the Powerbrain. Do not use any other USB cable, charging adapter or power supply. Always charge the Powerbrain fully!

b. Building and controlling robots

See www.tinkerbots.com for full construction and operating instructions.



WARNING To protect the material from strain, do not attach more than four motion modules or six modules in total to the same side of the Powerbrain (Illus. 4). Do not connect more than seven modules to the Powerbrain at one time. Always switch off the Powerbrain following use. To prevent overload responses, do not leave the Powerbrain running unwatched with modules connected.

5) Cleaning and storage



WARNING Always disconnect the Powerbrain from the power unit before cleaning.

a. To clean, use only dry, lint-free materials, such as brushes or dry cloths.

NOTICE To avoid functional damage, do not use chemicals, cleaning fluids or other fluids. Clean only with dry materials, and only externally.

b. Store Tinkerbots at dry and cool locations (15–20°C / 60-70°F, rel. humidity 40–60%, not condensing).

NOTICE Storage for longer periods (> 2 weeks) at temperatures > 35°C (95°F) must be avoided. Storage at > 40°C (105°F) is not permissible. To avoid damage to the battery through total discharge, never store Tinkerbots with a fully empty battery. In the case of storage for longer periods (> 3 months), do not store Tinkerbots with a fully charged battery, but rather, with approx. 50–70% capacity remaining. After six months at the latest, check the charge status of the battery and, if needed, recharge.

6) Error indications; signals

a. Firmware update: a violet blinking LED lamp indicates that the Firmware of the relevant module must be updated. For this purpose, download the firmware update application (FUA) at tinkerbots.com and follow the instructions. (Illus. 5)

b. Switch-off in the event of overloading: a motion module's rapidly blinking red LED lamp will indicate an overload function. The module automatically will switch itself off for a few seconds. (Illus. 5)

NOTICE To prevent functional damage to the product, stop the cause of the overload function (e.g., impeding the motor from running in the appropriate direction, etc.) and avoid it in future. In the case of repeated overload switch-off, the relevant modules will cease to perform their motion fully; switch off for 10 to 15 minutes and allow to cool.

7) Removing from operation; disposal

NOTICE To maximise the prevention of negative effects to health and the environment, this product must be disposed of in a manner compliant with the EU Directive on Waste from Electrical and Electronic Equipment (WEEE).

This product has been designated as compliant with EU Directive 2012/19/EG on Waste from Electrical and Electronic Equipment (WEEE). Ensure that the device is disposed of properly. The WEEE symbol on the packaging indicates that this product may not be disposed of together with normal household waste, but rather, must be brought to the nearest disposal location for disused electrical and electronic equipment. Disposal must be compliant with the environmental guidelines in force for waste disposal. For further information on disposal, re-use and recycling of this product, please consult relevant local bodies (Environmental Protection Department) or the private waste management organisation in your town or city.

8) Symbols and Signs

= DC polarity of barrel jack connector on switching power unit (inside positive/outside negative)

9,0V 2000mA = Direct voltage switching power unit with 9.0V output voltage and a maximum output current of 2000mA

IP40 = Switching power unit with IP40 protection class (protected against 1mm and larger solid foreign bodies)

= Switching power unit tested in accordance with EN 61558-2-7 and EN 61558-2-16 safety of transformers

= Switching power unit complies with device protection class II

All Tinkerbots products are developed and produced in compliance with the regulations of Toy-Safety Directive 2009/48/EG. The full compliance statement is available from the manufacturer on request.

